

Whole Slide Image Analysis Quantification using Aperio Digital Imaging in a Mouse Lung Metastasis Model

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Digital whole slide imaging is the technique of digitizing a microscope slide at the highest resolution to produce a “digital virtual microscope slide”. This digital image can be viewed in three or four fields, from low to high power, which can be commonly used to evaluate the tissue. Many of these systems have whole slide software image analysis capability.

The goal of this study was to determine if the Aperio positive pixel algorithm (image analysis) could effectively quantitate metastatic mouse lung tumors in a lung section using a H&E stain. Lung sections from a mouse lung metastasis model of 8 mice per group were evaluated: control, 50mg/kg, and 75mg/kg carboplatin. H&E and Ki67 immunostain slides were scanned using the Aperio whole slide scanning system (Scanscope CS). A single field of view from each slide representing a whole lung lobe with multiple lung metastases was selected for image analysis. The standard positive pixel algorithm was altered to read the H&E slides. Various histology slides were used to validate the altered algorithm. The immunostain (Ki67) was generated using the standard positive pixel algorithm analysis.

The Aperio automated positive pixel count for a Ki67 immunostain was consistent with the H&E image analysis. The values decreased with a dose dependent treatment (control vs. 50mg/kg and 75mg/kg carboplatin) and were (H&E) 37%, 28%, and 22%, and (Ki67) 9%, 5%, and 3%.

The analysis had decreasing values for both the H&E and Ki67 analysis on a dose dependent drug treatment. The metastases decreased in both treatment groups compared to controls with both the H&E and Ki67 analyses. The Aperio Image Analysis positive pixel algorithm allows large areas of the lung tissue section to be examined and not just a single 25x or 40x field like many common image analyses systems.

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